

STONER ENGINEERING and SURVEYING

Date: May 11, 2016

To: Tom Bird, Manager, Coal Services
GCC Energy, LLC
6473 County Road 120
Hesperus, CO 81326

Re: Redesign of Flemings OWTS for GCC Main Office and Restrooms

Stoner Engineering and Surveying has visually inspected the above system that is used to disperse waste water from your main office, showers and restrooms. During the week of April 24, 2016 addition reject sand was added to the existing absorption field and to the south of the existing absorption to prevent wastewater from surfacing. At this time the system appears to be performing as intended, but we still need to equalize the flows from the showers to make the system perform at its maximum.

Stoner Engineering and Surveying proposes the following design to permanently fix the Onsite Wastewater Treatment System currently in use at GCC Mine.

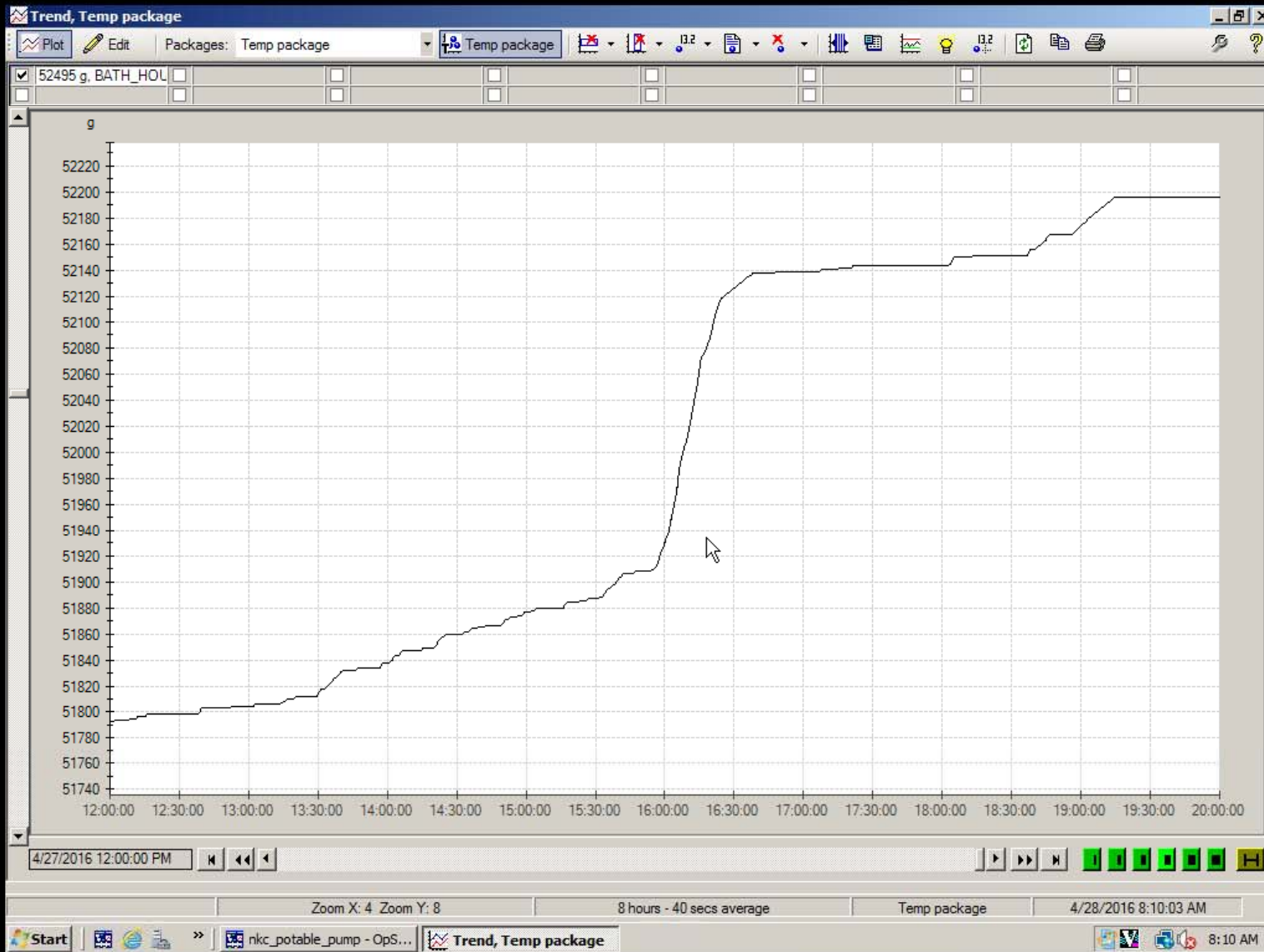
1. In the second chamber of the 4000 gallon tank an Orenco Biotube Easy Pack Pump Package will be installed (see attachment). This will allow the flow through the tank to be equalized (On April 27, 2016, 230 gallons of water passed through the tank in 43 minutes. Only 420 gallons were used on April 27, 2016). Over a 76 day period the average bathhouse water usage was 657 gallons per day with the highest usage day being 1134 gallons and the lowest day usage being 294 gallons. Using the Biotube we propose to pump an average of 30 gallons an hour to a new disposal field. This will allow for a longer retention time in the first chamber of the 4000 tank.
2. The new absorption field will be designed to accept a total of 1800 gallons per day (Average of a high of 1134 gallons per day round up to 1200 gallons per day then a safety factor of 1.5 applied).
3. The new field will be equivalent to 12 bedrooms containing 2 people per bed room therefore we will recommend using 12 bedrooms times 6 Eljen end drain pads per bedroom for a total of 72 Eljen pads.
4. Field testing of the new proposed area absorption field will occur later this week, but we anticipate a field size of approximately 2800 square feet containing six (6) rows of 24 Eljen pads. Using an indexing valve two row will be dosed at a time. Each dosing will be approximately 30 gallons (see preliminary design attachment).

With permission after your review a copy of this letter will be forwarded to San Juan Basin Health Department for their preliminary comments.

We at Stoner Engineering and Surveying will be pleased to answer your additional questions that may arise as we design the new components for the existing system.

Respectfully submitted,

Wayne M. Dale, P.E.
Colorado License 18688



Subject: End of shift water surge

From: Bird Tom (tbird@gcc.com)

To: sundale@yahoo.com;

Cc: tpeterson@gcc.com; wwymore@gcc.com; jchlopek@gcc.com; cdorenkamp@gcc.com;

Date: Thursday, April 28, 2016 8:30 AM

Wayne,

Attached is a screenshot of end of day shift water usage for yesterday. You'll note that we used about 230 gallons of water in about 43 minutes. Some of that went to the boot wash, but probably 70 – 80% ends up in the leach field.

Tom

Tom Bird

GCC Energy, LLC

6473 County Road 120

Hesperus, CO 81326

970.385.4528 x 6503

970.769.1160 cell

Attachments

- End of Day Shift 2016 04 27.pdf (79.24KB)



Home Owner: GCC
 Address: 6473 County Road 120
Hesperus, Colorado

Calculated By: WMD
 Reviewed By: WD

Date: 05/11/16
 Date:

Job Number: 16012

PRELIMINARY CALCULATION SHEET

DESIGN PARAMETERS:

Total Bedrooms:	12			
LTAR: Silty Loam, Loam	0.50	[gal/day/ft ²]		
Retention Time:	30	[hours]	1.25	[days]

DESIGN FLOW:

Q = 75 [GPD] X Total Bdrms X 2 [Ppl/Bdrm] (first 3 bdrms)
 Q = 1800 [gal/day]

SEPTIC TANK SIZING:

Tank Size = Q X Minimum Residence Time (in days)
 Tank Size = 2,250 [gallons]

Existing Tank Volume = 4,000 Gallons

GENERAL BED DESIGN:

$$\text{Base Soil Treatment Area [ft}^2\text{]} = \frac{\text{Design Flow [gal/day]}}{\text{LTAR [gal/day/ft}^2\text{]}}$$

$$= 3,600 \quad \text{[ft}^2\text{]}$$

- | | | |
|------------------------|--------------------------|-----|
| Method of Application: | 1. Pressure Dosed Trench | 0.8 |
| Distribution Media: | 2. Pressure Dosed Bed | 1 |
| | 3. Eljen-In-Drain Units | 0.9 |
| | 4. Chambers | 0.7 |
| | 5. Dosed Siphon | 0.9 |

Adj. Soil Treatment Area [ft²] = Treatment Area X Adjustment Factors 1 & 2

Soil Treatment Area (Min.) = 2,592 [ft²] Eljen-In-Drain Units
 approximate size 40x 70= 2800 sq ft



Stoner Engineering & Surveying

GENERAL BED DESIGN (CONT.):

Number of Elgen In-Drain Units = 72 [Units] (8/Bedroom)

Use six (6) rows of twelve (12) units.

Only two rows will be dose at a time using a three valve

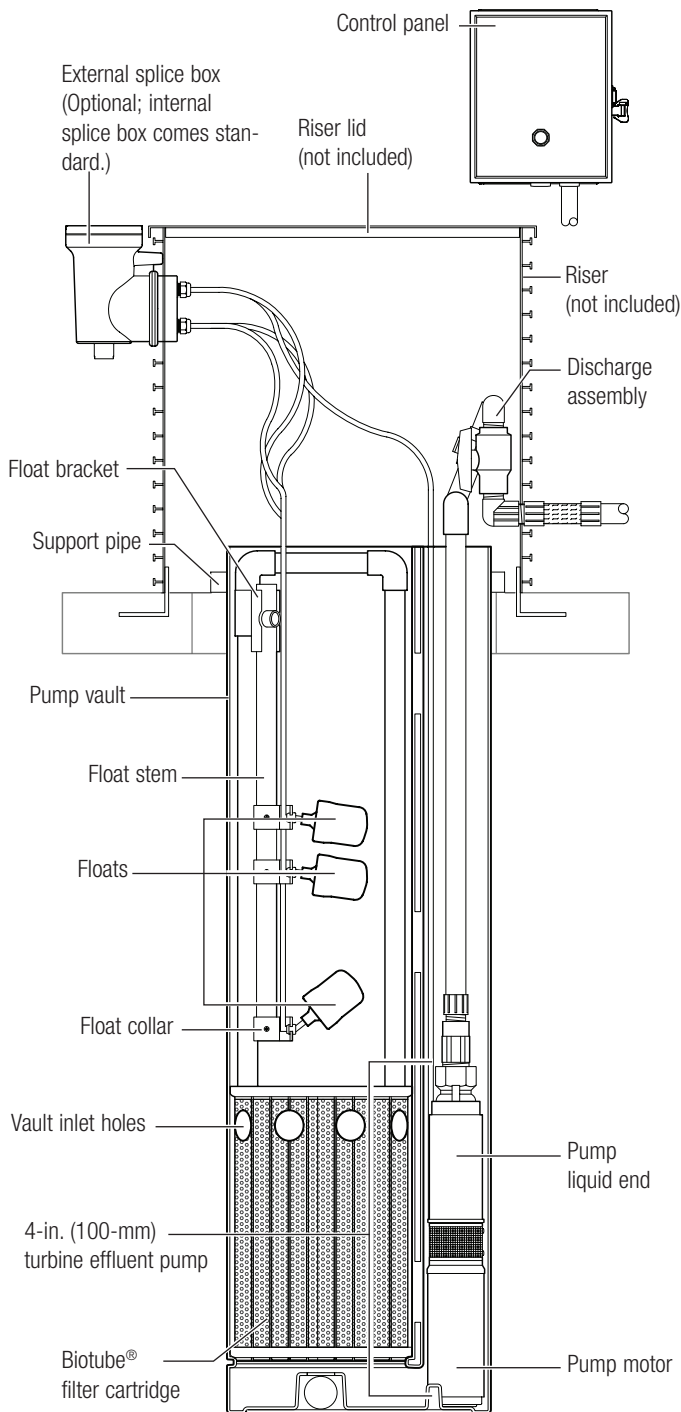
GENERAL NOTES:

- 1 Multiple Elgen/Infiltrator units on min. 6-inches of clean sand.
- 2 Bed Profile: Four (4) foot seperation over bedrock/high water table.
- 3 Elgen In-Drain units & pipe to be wrapped with an anti-siltration fabric.
- 4 Seperation distances from bed/leach fied to physical features:

Wells	100 [ft]
Lake, Stream, Ditch	50 [ft]
Potable Water Line	25 [ft]
Building	20 [ft]
Property Line	10 [ft]
- 5 Presurized pipe within treatment bed to be enclosed in SDR 35 perf pipe.
- 6 Inspection ports (4-inch PVC with caps) must be installed at end of lines.

Biotube® ProPak™ Pump Package

60-Hz Series Pump Packages



Biotube® ProPak™ pump package components.

Applications

The Biotube ProPak is designed to filter and pump effluent to either gravity or pressurized discharge points. It is intended for use in a septic tank (one- or two-compartment) and can also be used in a pump tank.

The Biotube ProPak is designed to allow the effluent filter to be removed for cleaning without the need to remove the pump vault or pump, simplifying servicing.

Complete packages are available for on-demand or timed dosing systems with flow rates of 10, 20, 30, and 50-gpm* (0.6, 1.3, 1.9, and 3.2 L/sec), as well as with 50 Hz and 60 Hz power supplies.

General

Orenco's Biotube® ProPak™ is a complete, integrated pump package for filtering and pumping effluent from septic tanks. And its patented pump vault technology eliminates the need for separate dosing tanks.

This document provides detailed information on the ProPak pump vault and filter, 4-in. (100-mm) 60-Hz turbine effluent pump, and control panel. For more information on other ProPak components, see the following Orenco technical documents:

- Float Switch Assemblies (NTD-MF-MF-1)
- Discharge Assemblies (NTD-HV-HV-1)
- Splice Boxes (NTD-SB-SB-1)
- External Splice Box (NTD-SB-SB-1)

Standard Models

BPP10DD, BPP20DD, BPP20DD-SX, BPP30TDA, BPP30TDD-SX, BBPP50TDA, BPP50TDD-SX

Product Code Diagram

BPP -

Standard options:

Blank = 57-in. (1448-mm) vault height, internal splice box, standard discharge assembly
 68 = 68-in. (1727-mm) vault height
 SX = external splice box
 CW = cold weather discharge assembly
 DB = drainback discharge assembly

Panel Application:

DD = demand dosing
 TDA = timed dosing, analog timer
 TDD = timed dosing, digital timer, elapsed time meter & counters

Pump flow rate (nominal):

10 = 10 gpm (0.6 L/sec)
 20 = 20 gpm (1.3 L/sec)
 30 = 30 gpm (1.9 L/sec)
 50 = 50 gpm (3.2 L/sec)

Biotube® ProPak™ pump vault

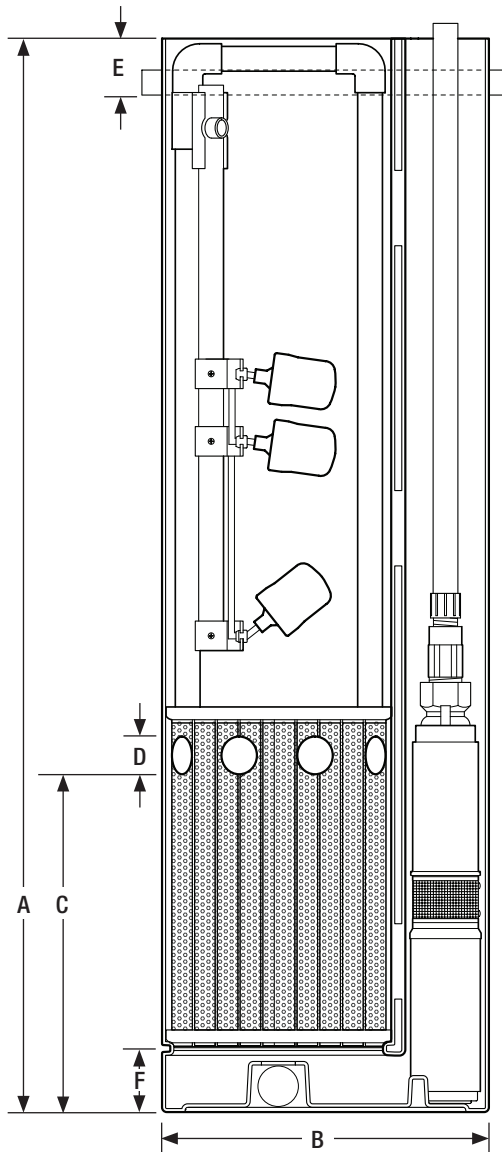
ProPak™ Pump Vault

Materials of Construction

Vault body	Polyethylene
Support pipes	PVC

Dimensions, in. (mm)

A - Overall vault height	57 (1448) or 68 (1727)
B - Vault diameter	17.3 (439)
C - Inlet hole height	19 (475)
D - Inlet hole diameter (eight holes total)	2 (50)
E - Vault top to support pipe bracket base	3 (76)
F - Vault bottom to filter cartridge base	4 (102)



ProPak™ pump vault (shown with Biotube filter and effluent pump)

Biotube® Filter Cartridge

Materials of Construction

Filter tubes	Polyethylene
Cartridge end plates	Polyurethane
Handle assembly	PVC

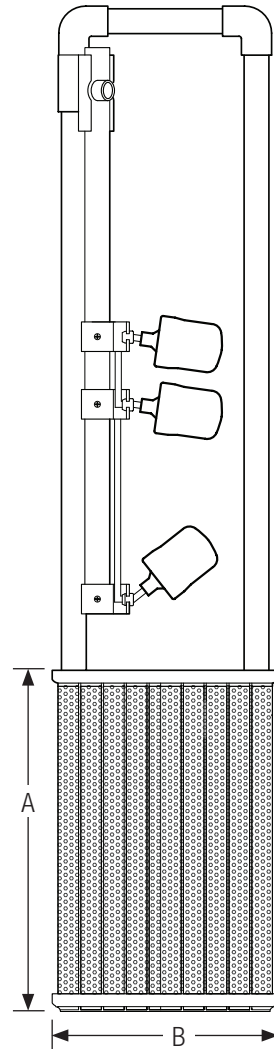
Dimensions, in. (mm)

A - Cartridge height	18 (457)
B - Cartridge width	12 (305)

Performance

Biotube® mesh opening	0.125 in. (3 mm)*
Total filter flow area	4.4 ft² (0.4 m²)
Total filter surface area	14.5 ft² (1.35 m²)
Maximum flow rate	140 gpm (8.8 L/sec)

*0.062-in. (1.6-mm) filter mesh available



Biotube® filter cartridge (shown with float switch assembly)

4-in. (100-mm) Turbine Effluent Pumps*

Orenco's 4-in. (100 mm) Turbine Effluent Pumps are constructed of lightweight, corrosion-resistant stainless steel and engineered plastics; all are field-serviceable and repairable with common tools. All 60-Hz PF Series models are CSA certified to the U.S. and Canadian safety standards for effluent pumps, and meet UL requirements.

Power cords for Orenco's 4-in. (100-mm) turbine effluent pumps are Type SOOW 600-V motor cable (suitable for Class 1, Division 1 and 2 applications).

Materials of Construction

Discharge:	Stainless steel or glass-filled polypropylene
Discharge bearing:	Engineered thermoplastic (PEEK)
Diffusers:	Glass-filled PPO
Impellers:	Acetal (20-, 30-gpm), Noryl (50-gpm)
Intake screens:	Polypropylene
Suction connection:	Stainless steel
Drive shaft:	300 series stainless steel
Coupling:	Sintered 300 series stainless steel
Shell:	300 series stainless steel
Lubricant:	Deionized water and propylene glycol

Specifications

Nom. flow, gpm (L/sec)	Length in. (mm)	Weight lb (kg)	Discharge in., nominal ¹	Impellers
10 (0.6)	23.0 (660)	26 (11)	1.25	6
20 (1.3)	22.5 (572)	26 (11)	1.25	4
30 (1.9)	21.3 (541)	25 (11)	1.25	3
50 (3.2)	20.3 (516)	27 (12)	2.00	2

Performance

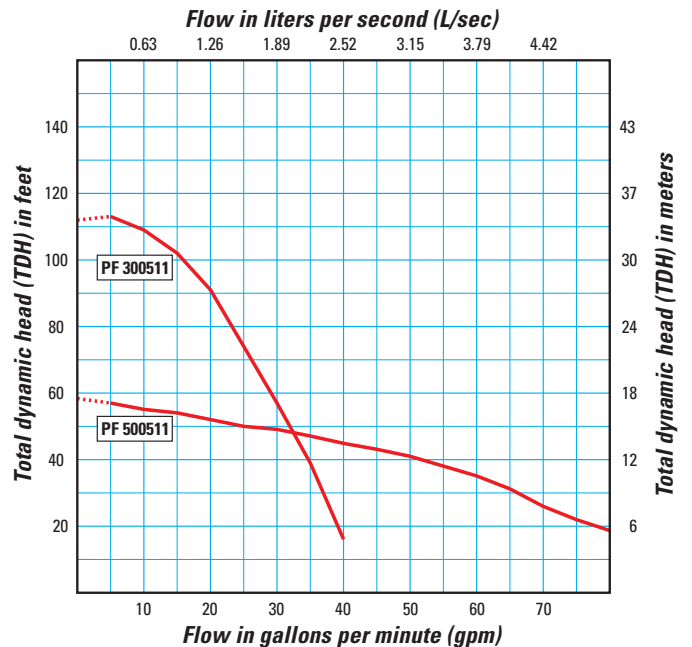
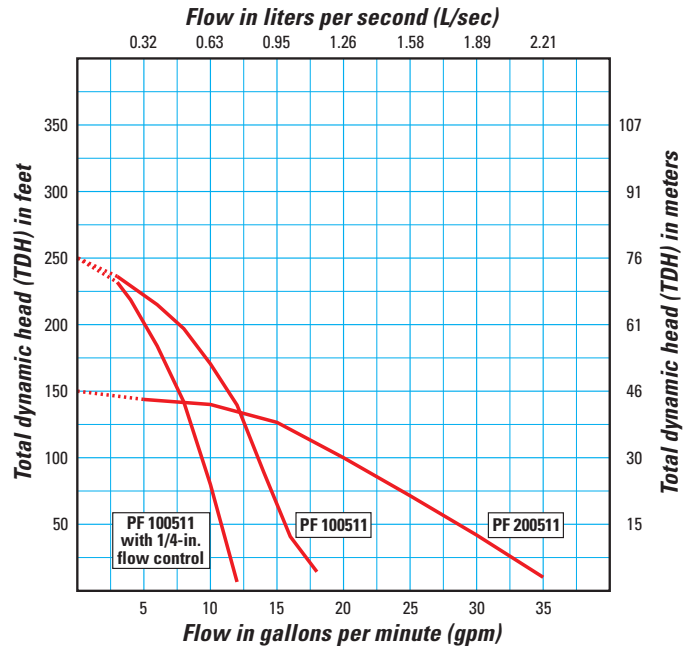
Nom. flow, gpm (L/sec)	hp (kW)	Design flow amps	Rated cycles/day	Min liquid level, in. (mm) ²
10 (0.6)	0.5 (0.37)	12.7	300	16 (406)
20 (1.3)	0.5 (0.37)	12.3	300	18 (457)
30 (1.9)	0.5 (0.37)	11.8	300	20 (508)
50 (3.2)	0.5 (0.37)	12.1	300	24 (610)

¹ Discharge is female NPT threaded, U.S. nominal size, to accommodate Orenco® discharge hose and valve assemblies. Consult your Orenco Distributor about fittings to connect discharge assemblies to metric-sized piping.

² Minimum liquid level is for single pumps when installed in an Orenco Biotube® ProPak™ Pump Vault.

Pump Curves

Pump curves, such as those shown here, can help you determine the best pump for your system. Pump curves show the relationship between flow (gpm or L/sec) and pressure (TDH), providing a graphical representation of a pump's performance range. Pumps perform best at their nominal flow rate, measured in gpm or L/sec.



Control Panel (Demand Dose)

Orenco's ProPak™ demand dose control panels are specifically engineered for the ProPak pump package and are ideal for applications such as demand dosing from a septic tank into a conventional gravity drainfield.

Materials of Construction

Enclosure	UV-resistant fiberglass, UL Type 4X
Hinges	Stainless steel

Dimensions, in. (mm)

A - Height	11.5 (290)
B - Width	9.5 (240)
C - Depth	5.4 (135)

Specifications

Panel ratings	120 V, 3/4 hp (0.56 kW), 14 A, single phase, 60 Hz
1. Motor-start contactor	16 FLA, 1 hp (0.75 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA)
2. Circuit breakers	120 V, 10 A, OFF/ON switch, Single pole
3. Toggle switch	Single-pole, double-throw HOA switch, 20 A
4. Audio alarm	95 dB at 24 in. (600 mm), warble-tone sound, UL Type 4X
5. Audio alarm silence relay	120 V, automatic reset, DIN rail mount
6. Visual alarm	7/8-in. (22-mm) diameter red lens, "Push-to-silence," 120 V LED, UL Type 4X

Control Panel (Timed Dose)

Orenco's ProPak timed dose control panels are specifically engineered for the ProPak pump package and are ideal for applications such as timed dosing from a septic tank into a pressurized drainfield or mound. Analog or digital timers are available.

Materials of Construction

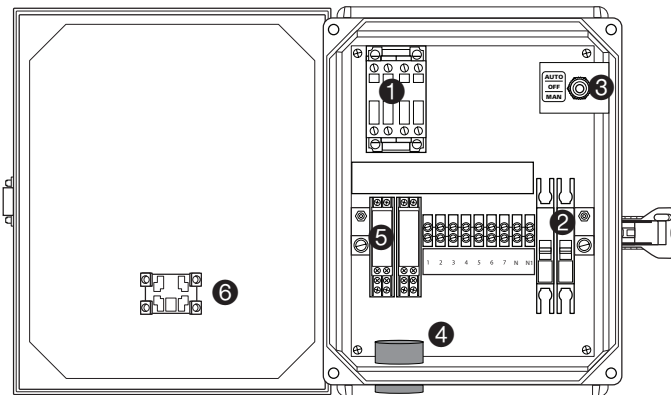
Enclosure	UV-resistant fiberglass, UL Type 4X
Hinges	Stainless steel

Dimensions, in. (mm)

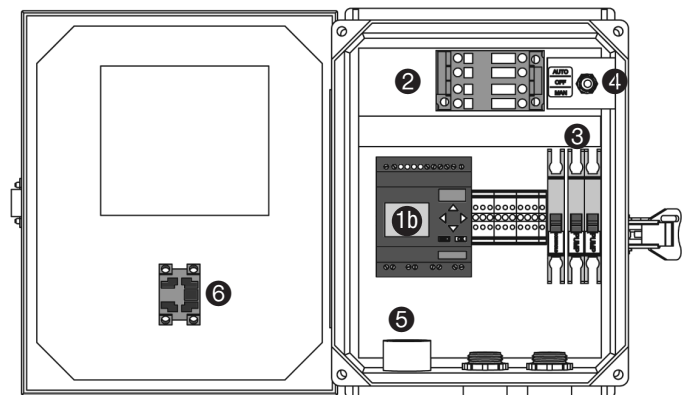
A - Height	11.5 (290)
B - Width	9.5 (240)
C - Depth	5.4 (135)

Specifications

Panel ratings	120 V, 3/4 hp (0.56 kW), 14 A, single phase, 60 Hz
Dual-mode	Programmable for timed- or demand-dosing (digital timed-dosing panels only)
1a. Analog timer	120 V, repeat cycle from 0.05 seconds to 30 hours. Separate variable controls for OFF and ON time periods
1b. Digital timer	120-V programmable logic unit with built-in LCD screen and programming keys. Provides control functions and timing for panel operation
2. Motor-start contactor	16 FLA, 1 hp (0.75 kW), 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA)
3. Circuit breakers	120 V, 10 A, OFF/ON switch. Single pole 120 V
4. Toggle Switch	Single-pole, double-throw HOA switch, 20 A
5. Audio alarm	95 dB at 24 in. (600 mm), warble-tone sound, UL Type 4X
6. Visual alarm	7/8-in. (22-mm) diameter red lens, "Push-to-silence", 120 V LED, UL Type 4X



Control panel, demand-dose



Control panel, timed-dose (digital timer model shown)